

REMARKS/ARGUMENTS

The claims were amended so as to avoid the issue of the parentheses in the expression "(% by weight)". This was done by removing the parenthesis.

Claims 1-22 were amended so as to remove the numbers used for the hole blocking layer and the electron blocking layer.

Withdrawal of the formal rejections is therefore requested.

A. Claims 1, 3, 16, 24-25, and 36-37 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Motomatsu (US Patent No 6,541,909) in view of Thompson et al (US PG Pub. No. 2003/0068528).

B. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and further in view of Wolk et al. (US PG Pub. No. 2002/0197554).

C. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and further in view of Thompson et al. (US PG Pub. No. 2003/0059647).

D. Claims 5, 7 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view Kim et al. (US PG Pub. No. 2005/0170621).

E. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Kim (621) and further in view of Wolk et al. (US PG Pub. No. 2002/0197554).

F. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Kim (621) and further in view of Thompson et al. (US PG Pub. No. 2003/0124381).

G. Claims 9, 12, 14, 18, 20, 32-33, 4041 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and further in view of Kim (621).

H. Claims 10-11, 19 and 21-22 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and Kim (621) and further in view of Wolk (554).

I. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and Kim (621) and further in view of Thompson et al. (US PG Pub. No. 2003/0059647).

J. Claim 15 is rejected Under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and Kim (621) and further in view of Thompson (381).

K. Claims 23 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and further in view of Thompson et al. (US Patent No. 6,951,694).

L. Claims 26 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and further in view of Lamansky et al. (US PG Pub. No. 2002/0182441).

M. Claim 27 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Motomatsu (909) in view of Kim (621) and further in view of Thompson 694).

N. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Kim (621) and further in view of Lamansky (441).

O. Claims 31, 39 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and Kim (621) further in view of Thompson (694).

P. Claims 34 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Thompson (528) and Kim (621) and further in view of Lamansky (441).

Q. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu (909) in view of Lamansky (441).

Claim 1 is rejected over the combined teachings of references cited in above Item A (Motomatsu in view of Thompson).

There are a large number of additional rejections of dependent claims, all of which rely primarily on Motomatsu.

With respect to claim 1, the Examiner states that Motomatsu discloses that the amount of material in the hole blocking layer (7) in relation to the amount of material in the luminescent layer (4) based on the following:

.6%/(3.33)(1%) to 6%/(3.33)(10%) or .18(18%) which the Examiner states is within the claimed range.

This calculation misinterprets the claim. The "content" used in Claim 1 of the present application represents a content ratio in % by weight, of the phosphorescent compound contained in hole blocking layer 1 as a percentage of the content ratio in % by weight, of the phosphorescent compound contained in the light

emitting layer (which is clearly described as such as in Table 1 and in the last paragraph of Claim 1).

For example, in the 3rd column from the left of Table 1 (page 92), Content A of Phosphorescent or Fluorescent Compound in Light Emission Layer is clearly expressed as "% by weight". Contents B (Hole blocking layer) in the next column in Table 1 is also expressed as "% by weight" in the same manner. The % by weight is defined in the footnotes under the Table and in the last paragraph of Claim 1.

Accordingly, the "content" used in Claim 1 of the present application does not express the "amount" of the phosphorescent compound contained in the light emitting layer or in the hole blocking layer, it states that the content in % by weight, amount of a phosphorescent compound in the hole blocking layer is 0.1 to 20% of the content, in % by weight, of a phosphorescent compound in the light emitting layer. This is in contrast to the Examiners calculation and reasoning. Combining the teaching of Thompson does not correct this difference between the claim range and the disclosure in Motomatsu.

Motomatsu teaches that "it is preferable that a doped amount in the luminescent layer 4 is in a range of 1 to 10% by volume, and a doped amount in the doped layer 7 is in a range of about 0.6 to 6% by volume. As one example, when the doped amount in the luminescent layer 4 was set to 5%, a doped amount in the region where the electron transport layer 5a contacts the luminescent layer 4, or the doped layer 7 (the electron transport layer can work also as a hole blocking layer), was set to 3%" (Column 4, line 19-26 of Motomatsu).

Namely, the preferable dopant amount (% by volume) in the doped layer 7 of Motomatsu is 60% of the doped amount (% by volume) in the luminescent layer 4, which is far beyond the upper limit of the claimed range of the present application, namely, 20%. Adding Thompson does not bring the prior art combined teaching down to this upper limit, nor render it obvious.

As an example for the present invention, in TABLE 1 of the present application, "the content in % by weight of the phosphorescent compound contained in hole blocking layer 1" of Organic EL element 1-1 is 0.05% by weight, which is "a content ratio (% by weight)" (based on the total weight of the hole

blocking layer) but not "an amount", while "the content in % by weight of the phosphorescent compound contained in the light emission layer" is 6% by weight (based on the total weight of the light emission layer). Thus, "the content (% by weight) of the phosphorescent compound contained in the hole blocking layer" is 0.8331% of "the content (% by weight) of the phosphorescent compound contained in the light emission layer", which is within the claimed range (0.1 - 20%).

Accordingly, Claim 1 is not shown or suggested by Motomatsu alone or in combination with Thompson. The additional art cited with this combination does not render the differences detailed above, obvious. Therefore, combining the teaching does not render the claims dependent on Claim 1, obvious.

Claims 5 and 9 were rejected according to above rejection Items D and G, respectively. These rejections further rely on Kim.

In the reasoning of each of the rejections described in above Items D and G the rejection relies on the Examiner's calculation, namely:

.6%/(3.33)(1%) to 6%/(3.33)(10%) or .18(18%).

Based on the explanation detailed above with respect to this calculation as applied to Claim 1, the rejection of Claim 9 should also be withdrawn (see Claim 9, last paragraph). Adding Kim does not change this conclusion since the combination fails to provide missing teaching.

Claim 5 is rejected over a combination of Motomatsu and Kim. The reasoning above applies here. The teaching missing in Motomatsu is not found in Kim. Therefore, combining Kim does not show or suggest the claimed invention. The additional art added to these combinations do not provide or modify the primary combination with respect to the differences.

Withdrawal of the rejections of Claims 5 and 9 and of the claims dependent on them, is therefore requested.

With respect to Claim 16, Claim 16 was rejected as in above Item A (same combination as applied to Claim 1).

The Examiner states, in page 7, lines 7-9 of the outstanding Office Action, as follows: "It is obvious that the amount of light emitted by the hole blocking or light emitting layer is directly related to the choice of material used for these layers and the amount of this material in each layer."

However, in page 35, line 26 through page 36, line 7 of the present Specification, it is described that "an organic electroluminescent (EL) element exhibiting long life and a high emission efficiency is obtained by an organic electroluminescent element comprising an anode and a cathode having therebetween a light emitting layer containing a phosphorescent compound, and hole blocking layer 1 provided adjacent to the light emitting layer and between the light emitting layer and the cathode, wherein hole blocking layer 1 contains a phosphorescent compound so that the amount of light emitted from hole blocking layer 1 is in the range 0.1 to 50% of the amount of light emitted from the light emitting layer."

Nothing in Motomatsu, as modified by Thompson(528) discloses or suggests the above effect of incorporating a phosphorescent compound in the hole blocking layer so that the amount of light emitted from hole blocking layer is in the range of 0.1 to 50% of the amount of light emitted from the light emitting layer.

Accordingly, no one of ordinary skill in the art would be suggested or motivated to prepare an organic electroluminescent element having a phosphorescent compound in the hole blocking

layer so that the amount of light emitted from hole blocking layer is in the range of 0.1 to 50% of the amount of light emitted from the light emitting layer, by Motomatsu as modified by Thompson (528). Thus, whether or not the Examiner is correct that the present invention is obviously enabled (amount of light is obviously related to the choice of materials) by the art, this does not render the claimed requirements obvious.

Accordingly, amended Claim 16 is not obvious over Motomatsu in view of Thompson.

Claims 18 and 20 were rejected according to above rejection Item G.

These claims (as was Claim 9) were rejected over the combination of Motomatsu and Thompson and further in combination of Kim. Kim teaches incorporation of a phosphorescent compound in an electron blocking layer (paragraph [0060], lines 20-23), however, Kim fails to teach the requirement of an amount of light emitted from electron blocking layer 1 is in the range of 0.1 to 50% of an amount of light emitted from the light emitting layer as stated by the Examiner in page 21 of the outstanding office Action.

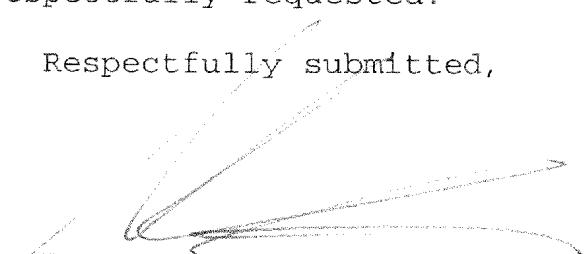
Appl. No. 10/565,043
Reply to Office Action of August 18, 2009

Therefore, as detailed above with respect to Claim 16,
Claims 18 and 20 are not obvious over the combination of
Motomatsu, Thompson and Kim.

In view of the above, the rejections are avoided. Allowance
of the application is therefore respectfully requested.

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Encs. Petition for One Month Extension of Time and Fee